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NEW AUSTRALIAN SAWFLIES (*Hymenoptera*, *Symphyla*).

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I have lately had the opportunity of studying a most interesting collection of sawflies from the Queensland Museum. The collection, of approximately 150 specimens, contained representatives of at least 15 new species; 13 of these are described in the present paper, while the descriptions of two others will appear later elsewhere.

One new genus is described *Styracotechys*, and for this *Styracotechyinae* a new subfamily of the *Pergidae*, had to be erected. Keys to a new classification of the *Pergidae* are included so as to show the position of this new subfamily in relation to the other subfamilies, and in the keys a new subfamily *Paralypiinae* is also instituted for the South American *Paralypia* and allied genera. Mention should also be made here to one further addition to the Australian fauna in *Senoclidea? furvus* Konow from Port Darwin. This species was previously known only from New Guinea.

The richness of this material, which was collected in the field mostly by Mr. H. Hacker, Entomologist of the Queensland Museum, suggests that there are still many more new species of sawflies yet to be found in Australia.

ARGIDÆ.

ANTARGIDIUM Morice.

I lately redefined this genus, Benson 1934 (1), and described two new species; in the present collection there are two more new ones, both having in the hind wing the recurrent vein nearer to the base of the wing than the cubital, so that the discoidal cell is smaller and shorter than the cubital as it is in *Antargidium allucente* Benson, fig. 1 of that paper, though the exact position of the recurrent vein is different in three specimens of one of the species. It now appears that the exact position of these veins differs in individuals of the same species, and probably, if long series could be examined, would be found to be of no significance in separating the species. A comparison of the saws of the new species with the three already described shows that the saw figured for *A. allucente* Benson, fig. 7 in my previous paper, is in some respects not typical for the genus; in all four other species the hair bands are replaced by a row of short broad-based spine (see figs. 1 and 2), and the denticulations are of the pattern illustrated in fig. 9 of that paper, although differing in detail. Furthermore the saw of *A. allucente* Benson was not figured

quite accurately, as further examination has revealed that it also has got a few broad-based spines obscured by the hairs in the hair-bands; these spines are not easily visible and were overlooked before.

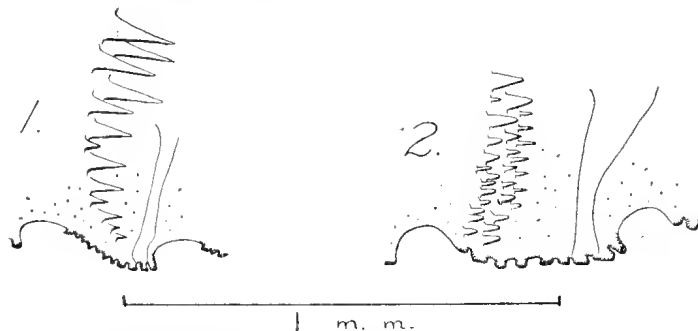


Fig. 1.—*Antargidium atriceps* sp. nov., tenth tooth of saw.

Fig. 2.—*A. rufum* sp. nov., tenth tooth of saw.

ANTARGIDIUM ATRICEPS sp. nov.

♂ ♀ *Colour*.—Yellow; black are the head (except palps and the tips of the mandibles), the meso- and meta-notum, a large spot on the mesopleura, the mesosternum, and the 6 apical segments of the abdomen except the base of the sawsheath in the ♀: apex of hind tibia and all tarsal segments slightly fuscous. Wings infusate throughout; stigma and venation black.

Length.—♀ 5.5 to 6.5 mm.; forewing 5.5 to 6.5 mm.; antenna 1.7 to 2 mm.:

♂ 6 mm.; forewing 6 mm.; antenna 2.5 mm.

Puncturation.—Rugulose on face; rest of insect shining and unpunctured. *Head*: malar space about two-thirds length of pedicel of antenna; pedicel about two-thirds as long as broad; supra-clypeal area with a well-developed carina reaching from clypeus to frontal area where it divides into 2 branches which surround the pear-shaped median fovea; ocellar basin deep, including front ocellus and surrounded by a pentagonal wall. *Legs*: with hind basitarsus about as long as three following tarsal segments together. *Wings*: recurrent vein in hind wings nearer to the base of the wing than the transverse-cubital vein, so much so that the recurrent vein is twice as far from the apex of the cubital vein as the transverse-cubital vein is. *Abdomen*: hind margin of hypopygium entire; sawsheath as in *A. allucente* Benson; saw fig. 1.

New South Wales, Tamboorine, 1 ♀, 1 ♂ (holotype and allotype), 21-ii-1927, H. Hacker (Queensland Museum); Queensland. Conondale 1 ♀, 7-i-1930, H. Hacker (British Museum); and a variety in which the transverse cubital vein is only about two-thirds as far from the apex of the cubital vein as the

recurrent vein (indicating that the positions of these veins are more liable to variation than was at first thought) and in which the black pigment is less widespread, so that the front and sides of mesonotum together with the scutellum and the metanotum are yellow, while the dark mark on the mesopleura is much smaller. Queensland, National Park, 1 ♀, xi-1920, H. Haeker (Queensland Museum).

This species is separated from all others in the genus by the black head in both sexes, the very pale legs, and the earina on the face reaching right to the front of the supraelypeal area; the sawsheath is most like that of *A. apicale* W. F. Kirby, but the dorsal tooth is not so sharp when viewed from the side.

ANTARGIDIUM RUFUM sp. nov.

♀ *Colour*.—Reddish yellow all over, except the tibiae and tarsal segments which are infuscated. Wings, infuscated throughout; stigma and venation black. *Length* 6.3 mm.; forewing 6.3 mm.; antenna 2.5 mm. *Punctuation* obsolete. *Head*: malar space about half as long as pedicel of antenna; pedicel about two-thirds as long as broad; supraelypeal area with the medial earina present on the hind two-thirds of the area, but not sharp, the front one-third is simply rounded; frons as in *A. atriceps* sp. nov. *Legs* with the hind basitarsus distinctly longer than the three following tarsal segments together. *Wings*: recurrent vein in the hindwing nearer to the base of the wing than the transverse-cubital vein, as in *A. allucente* Benson (Benson 1934 (1), fig. 1). *Abdomen*: hind margin of hypopygium entire; sawsheath as in *A. dentivalvis* Benson, but set up almost erect; saw fig. 2.

New South Wales, Tooloom, 2 ♀♀, i-1920, H. Haeker (holotype in Queensland Museum; paratype in the British Museum).

This species is distinguished from all others by the head and body being entirely reddish-yellow, and by the very short almost linear malar space. The sawsheath comes nearest to that of *A. dentivalvis* Benson, but it is set up almost erect, whereas in that species the sawsheath is not so set.

ANTARGIDIUM ? DENTIVALVIS Benson.

One female, Queensland, Townsville, Dr. H. Priestly, in bad condition, probably belongs to this species. It differs from the type in being larger (4.5 mm. instead of 4 mm.), in the sawsheath being set up erect at the apex and in the transverse-cubital vein in the hind-wing not being interstitial with the recurrent vein, but received on the cubital nearer the apex of the wing as in *A. allucente* Benson and typical *Arge*.

TENTHREDINIDÆ.

SENOCLIDEA ? FURVUS Konow.

Monophadnus furvus Konow, Wein ent. zt. xvii, 1898 : 232. North Australia, Port Darwin, 1♀, F. P. Dodd.

This species, previously known only in New Guinea, is a very interesting addition to the Australian sawfly fauna as it represents the first true Australian Tenthredinid (not counting, of course, *Caliroa limarina* Retz., which is obviously an alien that has been introduced with fruit trees into a great many parts of the world).

PTERYGOPHORIDÆ.

CLARISSA FLAMMEA, sp. nov.

♀ *Colour* reddish-yellow; head black except for the pale mouth-parts, clypeus, supraclypeal area, and antennæ; a large cream-coloured spot covering the hind half of the outer quarter of abdominal tergum 2. Wings hyaline, slightly infusate at the apex; veins at extreme base of wing, including basal half of costa yellow; rest of veins infusate; stigma infusate, with a pale transparent basal patch.

Length 6 mm.; forewing 5.5 mm.; antenna 2 mm.

Puncturation.—Head [and thorax dull with fine surface puncturation becoming rugulose on head; abdomen rugulosely sculptured. *Head*: mouthparts normal; malar space about as long as pedicel; antenna 11-segmented; subclavate pedicel a little longer than broad; segment 3 = 4 + 5 in length; only segments 9 and 10 broader than long; median fovea as a slight rounded depression. *Legs*: hind-basitarsus about equal to three following tarsal segments. *Abdomen*: with sawsheath normal; saw fig. 3.

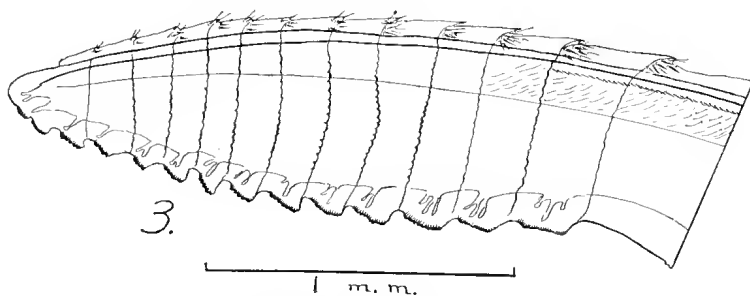


Fig. 3.—*Clarissa flammca* sp. nov., saw.

Queensland National Park, 1♀, 25-x-1923, H. Haeker (Queensland Museum).

This species is superficially very similar to *C. divergens* W. F. Kirby, and would run to that species in my key—Benson 1934 (2) p. 469. Externally

it is only distinguishable on colour characters, the thorax and abdomen being all red, while in *C. divergens* W. F. Kirby the mesepimeron, mesosternum, and metapleuræ together with the last two or three abdominal segments are black, and the costa being yellow at the base instead of all black. The saw is however quite different; it is more like the saw of *C. flavicornis* Benson (Benson 1934 (2) fig. 6a). The waved ridges on the side of the saw, however, suggest a link between the saw of *C. flavicornis* Benson and the spiny-ridged saw of *C. ruficollis* Benson.

Clarissa males.

In the collection were males belonging to four different species of this genus, but none of them seemed to belong to any of the described females. I have with some diffidence then described four new species based on the male sex only, which are separated in the key that follows from the already known males of *C. atrata* G. Turner and *C. divergens* W. F. Kirby. The male genitalia in this group seem to exhibit but slight and insufficient differences to be relied on yet for separating the species.

1. Pedicel clearly broader than long..... 5
 Pedicel longer than broad..... 2
2. Head and thorax metallic greenish-black; abdomen, except tergum 1, entirely reddish yellow; hind legs all black. Eyes strongly converge in front so that the malar space is linear.....*diana* sp. nov.
 Head and thorax shining black without metallic tinge; abdomen, only yellow banded, being black at base and apex; at least hind tibia mostly yellow. Eyes converge in front, but malar space is still at least half as long as the diameter of an ocellus..... 3
3. Flagellum of antenna yellow; the segments each being strongly swollen apically. Punctuation on temples and thorax very fine, almost obsolete. Wings slightly infuscate..... *lucida* sp. nov.
 Antenna all black; the segments not noticeably swollen out apically. Punctuation on temples very fine and close.
 Wings hyaline..... 4
4. Abdomen with whole of segments 2, 3 and often part of 4 yellow..... *divergens* W. F. Kirby.
 Abdomen with only apices of segments 2, 3 and 4 yellow..... *atrata* G. Turner.
5. Flagellum of antenna together with a band on abdomen and legs (except coxæ, trochanters and tibial spurs) yellow. Inner apical spur to hind tibia, about half as long as hind basitarsus..... *antennata* sp. nov.

Antenna, abdomen and for the most part the hind legs black. Inner apical spur to hind tibia almost as long as hind basitarsus.
 *obscura* sp. nov.

CLARISSA DIANA sp. nov.

Colour.—Metallic greenish-black; yellow are on the fore legs, the front of the femur, the tibia and tarsi, on the middle legs a spot on the apex of the femur, and the whole of the abdomen except tergum 1. Wings slightly infusate throughout; veins and stigma black.

Length 4.7 mm.; forewing 4.5 mm.; antenna 2.2 mm.

Puncturation: head with very fine regular surface puncturation, but shining between the punctures; the punctures are visible also on the prothorax, but on the mesonotum and mesopleuræ the punctures are apparent only at the sides of the lobes, the middles of the lobes being unpunctured smooth and shining; abdomen with normal rugulose transverse sculpturing.

Head with eyes strongly converging in front so that they almost touch the side of the clypeus and the base of the mandible, leaving but a linear malar space; length of clypeus and labrum together equals the breadth of the clypeus; antenna 9-segmented; distinctly clubbed from the apex of segment 4; segment 2 (pedicel) longer than broad; median fovea as a long groove, joining the frontal furrow and reaching back to the front ocellus behind.

Wings as in *Clarissa divergens* W. F. Kirby, but in the unique type the first transverse cubital nerve is absent in the forewing.

Legs with inner spur on apex of hind tibia about half as long as hind-basitarsus; hind-basitarsus about equal to 2 following segments in length.

Abdomen with apex upturned; hypopygium entire behind.

Queensland, Nanango District, 1 ♂, xi-1927, H. Hacker (Queensland Museum).

CLARISSA LUCIDA sp. nov.

♂ *Colour* black; yellow are the labrum, flagellum of antenna, angles of pronotum behind, legs (except the infusate coxæ, trochanters and tibial spurs) and a band on the abdomen covering terga 2-4 and sterna 2-5. Wings infusate; stigma black with a paler base; costa and venation black basally but brownish apically.

Length 6.5 mm.; forewing 5.5 mm.; antenna 3.5 mm.

Puncturation fine dense and regular on face and frontal region, but obsolete on the temples whose surface is smooth and shining; obsolete also on

most of the thorax especially the lobes of the mesonotum where sparse vague punctures are only apparent in the hollows and at the sides; abdomen transversely rugulose.

Head: length of clypeus and labrum together about equals breadth of clypeus; malar space about as long as two-thirds the diameter of an ocellus; antenna 12-segmented, not club-shaped, but subserrate, the segments from 4 onwards being of equal breadth apically, but each one being very broad apically and narrow basally, so that the breadth basally is about two-thirds the breadth apically; median fovea as a deep rounded depression; vertical furrow clearly marked.

Legs with hind basitarsus equal to three following tarsal segments together; inner hind tibial spur about five-sevenths length of basitarsus; *Abdomen* with hypopygium set up erect, with the hind margin slightly two-lobed, being emarginate in the middle.

New South Wales, Tooloom, 2 ♂♂, i-1926 H. Hacker (holotype in Queensland Museum, paratype in British Museum).

CLARISSA ANTENNATA sp. nov.

Colour black: yellow are labrum flagellum of antenna hind angles of pronotum, legs (except coxæ trochanters and tibial spurs), a band on abdomen covering terga 2-4 and sterna 2-5 and the apex of the hypopygium. Wings almost hyaline, slightly infusate stigma (except for a pale spot at base), costa and venation dark brown.

Length 5.5 mm.; forewing 5 mm.; antenna 4 mm.

Punctuation on head fine dense and irregular, though on the clypeus and temples small unpunctured spaces occur between the punctures; pro- and mesonotum shining between scattered regular punctures; meso-pleuræ with regular very fine surface punctures; abdomen transversely rugulose dorsally.

Head: length of clypeus and labrum together about equal to breadth of clypeus; clypeus entire on front margin; malar space as long as the diameter of an ocellus; antenna 12-segmented not club-shaped; the breadth of segments 4 onwards being the same apically; pedicel clearly broader than long; segments from 4 onwards slightly broadened apically; median fovea as a deep rounded depression; vertical furrows very distinct. *Legs* with hind basitarsus equal to 2 following tarsal segments together in length; inner hind-tibial spur about five-sevenths as long as hind basitarsus. *Abdomen* with hypopygium normal in position, excised in middle on hind margin, and slightly emarginate each side.

Queensland, Tamborine Mountain, 1 ♂, W. H. Davidson (Queensland Museum).

CLARISSA OBSCURA sp. nov.

Colour black; pale brown are the labrum, front margin of elypeus, the front legs (except base of femur, trochanters and coxa) the middle and hind tibiae apically as well as the tarsal segments at their joints. Wings slightly infuscate; stigma and venation black, except basal half of costa which is brownish.

Length 6 mm.; forewing 5.5 mm.; antenna 4 mm. though the Brisbane specimen is 8 mm.; forewing 6.2 mm.; antenna 4.5 mm.

Puncturation on head dense, shallow and irregular, on nota of thorax in the form of regular round scattered punctures with shining smooth spaces between; the punctures are thicker at the sides of the lobes of the mesonotum and the scutellum, but sparser in the middle of the mesonotal lobes; on pleurae and sterna the puncturation is irregular and shallow; on the abdomen the dorsum is transversely rugulose.

Head: length of elypeus and labrum together equal to about the breadth of the elypeus; elypeus emarginate in the middle of the front margin; malar space in length about two-thirds the diameter of an ocellus; antennae 14-15 segmented, not club-shaped, increasing in breadth slightly until about segment 6 or 7, and then tapering slightly; funicle and pedicel very short; pedicel about twice as broad as long; segments 4 and onwards being each much broader apically than basally, the basal breadth being about two-thirds of the apical breadth; median fovea as a deep rounded depression; vertical furrows clearly defined. *Legs* with hind basitarsus equal to two following tarsal segments; inner hind tibial spur in Brisbane specimen equals about five-sixths length of basitarsus, in other specimens almost equals basitarsus in length. *Abdomen* with hypopygium set up erect, and entire on hind margin.

Queensland, 3 ♂♂ (including Holotype) Tamborine Mountain, W. H. Davidson; 1 ♂ Brisbane, 7-xii-1924, H. Hacker (holotype and one paratype Queensland Museum, two paratypes in British Museum.)

DIPHAMORPHOS PALLICORNIS sp. nov.

Colour black; yellow are labrum, elypeus in front, antenna, pronotum, tegula, a longitudinal band in the middle of the mesonotum covering the whole of the front lobe, and the middle of the side lobes, sides of scutellum and upper part of mesopleurae, legs except the coxae at their bases, and the neighbourhood of the sawsheath.

Length 5 mm.; forewing 4.5 mm.; antenna 1.5 mm.

Puncturation: head (except elypeus and labrum which are smooth) with a rough surface, dull but without regular punctures; behind the temples the

sculpturing is denser; on the thorax the roughness is absent in the middle of mesonotal lobes and scutellum which are perfectly smooth and shining; abdomen transversely rugulose.

Head: clypeus entire; malar space very short, about half the diameter of an ocellus in length; antenna (fig. 4a) 10-segmented; pedicel about as long as broad; segment 3 greater in length than $4 + 5$; flagellum setiform; no segment broader than long; median fovea well marked as a deep depression.

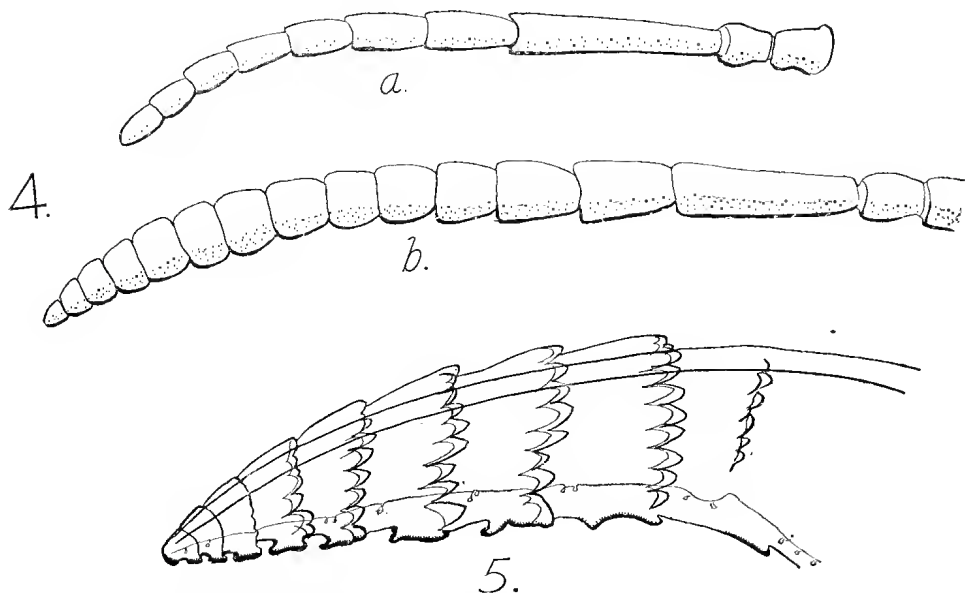


Fig. 4.—Antenna of (a) *Diphamorphos pallicornis* sp. nov., (b) *D. minor* Rohwer.

Fig. 5.—*D. pallicornis* sp. nov., saw.

Legs with hind basitarsus equal in length to three following tarsal segments together.

Abdomen.—Hypopygium with a triangular area, lightly chitinized, in the middle of the hind margin; sawsheath viewed from above small and slightly emarginate apically with curved hairs; saw fig. 5.

New South Wales, Tooloom, 2♀♀, i-1926, H. Hacker (holotype in Queensland Museum, paratype in British Museum).

This species is at once distinguished from the three previously described in the colour and form of its antennæ which are yellow, only 10-segmented, setiform, with no segments broader than long (cf. fig. 4a and b). For a key to the previously described species see Benson 1934 (2): 471. The saw and sawsheath are typical also for the other known species in this genus.

NEOEURYS BREVIVALVIS sp. nov.

♀ *Colour* metallic black with a slightly greenish tinge on head and thorax; yellow are mandibles, front of labrum, all the sterna including hypopygium of abdomen as well as the lateral portions of the terga, and the apices of the femora: rest of legs yellowish white infuscated on apices of tarsal segments. Wings hyaline; stigma pale brown with basal half white; venation brown.

Length 4.8 mm.; forewing 4.5 mm.; antenna 1.2 mm.

Puncturation.—Head and thorax shining unpunctured except for small hair follicles; abdomen transversely rugulose.

Head.—Clypeus with front margin entire; malar space about as long as apical breadth of pedicel; antenna 9-segmented, subclavate; pedicel longer than broad (in proportion of about 5:3); median fovea deep in front, continuing back as a groove as far as front ocellus. *Legs* with hind basitarsus about equal to three following tarsal segments in length.

Abdomen laterally compressed and from the side appears truncate at the apex because the sawsheath is set up erect (fig. 6a); saw of normal type but simplified (fig. 6b).

Queensland, Brisbane, 1♀ (Holotype), 17-ix-1914, and 1♀ (paratype), 8-ix-1915, H. Haeker (holotype in Queensland Museum, paratype in British Museum).

This species would run down in my key to *N. ventralis* Forsins (Tasmania), which is a larger species in which the sawsheath is normal in position and the saw is more complex (see Benson 1934 (2) p. 476, fig. 6f for sawsheath and fig. 9b for saw).

NEOEURYS AURORA sp. nov.

♀ *Colour*: metallic black with green reflections on head and thorax; yellow are mandibles and labrum, flagellum of antenna on underside from apical half of segment 4, apex of femora, tibiae and on front and middle legs bases of, all tarsal segments on hind legs, only basal half of basitarsus, and apex of abdomen from segment 7, except the medial dorsal portion of segment 7 and 8. Wings hyaline, stigma light brown at the apex with the basal half white, venation brown.

Length 3.5 to 4 mm.; forewing 3.5 to 4 mm.; antenna 1.3 mm.

Puncturation.—Head and thorax dull with a rough coriaceous surface, actual punctures being for the most part ill-defined and irregular.

Head.—Clypeus entire in front; malar space about as long as apical breadth of pedicel; antenna 10-segmented, subclavate; pedicel longer than broad (in proportion of about 5:3); median fovea deeply impressed and

continuing back as a shallow groove as far as front ocellus. *Legs*.—Hind basitarsus about equal in length to three following tarsal segments.

Abdomen laterally compressed and almost truncate when viewed from the side (fig. 7a), because the sawsheath is set up in an erect position almost as much as in *N. brevivalvis* sp. nov.; sawsheath from above appears as in *N. caudata* Morice (Benson 1934 (2), fig. 8c), but the hairs each side are straight; saw fig. 7b.

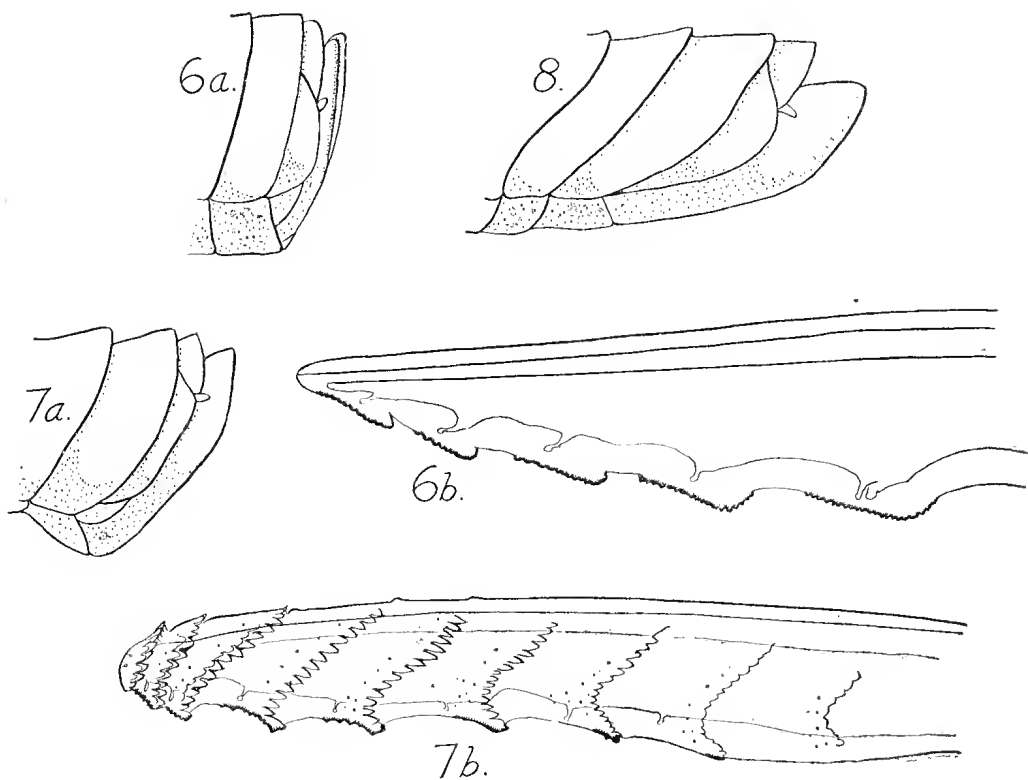


Fig. 6.—*Neocourys brevivalvis* sp. nov.:

- (a) apex of the abdomen of the female from the side;
- (b) saw.

Fig. 7.—*N. aurora* sp. nov.:

- (a) apex of the abdomen of the female from the side;
- (b) saw.

Fig. 8.—*N. caudata* Morice, apex of the abdomen of the female from the side.

Queensland, Stanthorpe, 2 ♀♀, 12-viii-1925 (holotype in Queensland Museum, paratype in British Museum).

This species would run to *N. caudata* Morice (Tasmania) in my previous key and superficially is rather like that species. *N. caudata* Morice is, however, much larger, has black mandibles, labrum and antennæ, has a malar space decidedly longer than the pedicel, has a sawsheath in normal position (not erect) (cf. figs. 7a and 8), curved hairs on the side of the sawsheath when viewed from above, and different saw (see figure in my previous paper). The saw of *N. aurora* sp. nov. is unlike any other previously met with in the genus and is more like that of a typical *Diphamorphos* sp., and, from its strong build and arrangement of spiny projections, suggests that the species oviposits in some coarse plant tissue.

Both *N. aurora* sp. nov. and *N. brevisalvis* sp. nov. differ from all previously described. *Neoeurys* in the peculiar erect position of the sawsheath and the slightly shorter malar space.

PERGIDÆ.

For one of the most interesting specimens in the collection it was found necessary to erect a new genus and subfamily. In order to place the new subfamily the following system of classification is put forward provisionally. The system is convenient at present, but, no doubt, when more genera are discovered, it will prove to be inadequate.

1. Radial cell in hind wing open at apex; cubitus and cubital veins forming the apex of the subcostal cell in hindwing are in one straight line and transverse.

[Eyes converge in front leaving a linear malar space; propodeum is deeply emarginate behind, leaving exposed a large poorly chitinized area; antennæ very short, of not more than 6 segments in all, and threadlike. 1st transverse cubital vein missing.]

Genera: *Acordulecera* Say, *Ceratoperia* Enderlein and *Thulea* Say (South American region),..... ACORDULECERINÆ.

- , Radial cell in hind wing closed at apex; cubitus and cubital veins forming apex of the subcostal vein in hindwing are not in one straight line, the cubitus being longitudinal..... 2
2. Abdomen long and tapering posteriorly; in ♀ tergum 9 elongate. Head twice as broad as high when viewed from in front; ♂ antenna with apical dorsal projections to segments. Eyes almost round when viewed from side and set far away from mandibles leaving a malar space about as long as half the diameter of an eye! Antennæ set behind the clypeus at a distance of about the length of the malar space. Forewing with 1st recurrent vein

bent at a right angle in the middle, so that, whereas the hind or inner portion of the vein runs towards the base of the stigma, the front or outer portion runs towards the apex of the wing and joins the cubital vein near the middle of the 2nd cubital cell (see Morice 1919, plate xi, fig. 6).

[Propodeum only slightly emarginate behind. Larvæ leaf miners in *Eucalyptus*.]

Genus: *Phylacteophaga* Froggatt (S. Australia),..... PHYLACTEOPHAGINÆ.

- Abdomen normal. Head normal. Antennæ in ♂ without dorsal projections to segments. Malar space short, little more than length of pedicel at the most. Antennæ set very close to hind margin of clypeus. Forewing with the first recurrent vein straight throughout and subparallel with basal vein..... 3

- 3. Forewing with petiolate anal cell present. [Small species under 5 mm. in length. Antenna 14-segmented. Basal vein in forewing joins costa at junction of cubital and costa; 1st transverse cubital vein missing. Propodeum strongly emarginate behind leaving exposed a large semi-circular blotch of poorly ehitinized surface.]

Genus: *Styracotechys* gen. nov. (Queensland), STYRACOTECHYINÆ (subfamily new).

- Forewing without anal cell..... 4
- 4. Forewing with basal vein received on costa at junction of costa and cubital vein.
1st cubital vein subequal with 2nd; 1st transverse cubital vein at less than a right angle with 2nd. Mostly large species over 8 mm. in length, with antennæ (except in *Cerealces*) short and club-shaped. Propodeum not strongly emarginate behind so that the blotch is very small.]

Genera: *Cerealces* W. F. Kirby, *Perga* Leach and *Xyloperga* Shipp (Australia) PERGINÆ.

- Forewing with basal vein received on cubital at a short distance from where the cubital leaves the costa; the portion of the cubital between the junction with the basal and the junction with the costa (*i.e.*, the cubitus) is bent back towards the apex of the wing and is in a straight line with the basal vein..... 5
- 5. Forewing with 1st cubital cell very short (broader than long); 1st transverse cubital vein set at right angles to 2nd..... 6

- . Forewing with 1st cubital cell subequal with 2nd in length and clearly longer than broad; 1st transverse cubital vein set at much less than a right angle to the 2nd. [Palps of mouthparts generally much reduced; antennæ short, subclavate, with regular annular segments. Preapical spines to middle and hind tibiae very short. Forewing generally with 4 cubital cells of which the 2nd receives both recurrent veins. Propodeum strongly emarginate behind in the middle leaving a large blotch as in *Acordulecera*.]

Genera: *Acorduleceridea* Rohwer, *Giladeus* Brethes, *Lagideus* Konow and *Paralypia* Kirby (South American Region)..... PARALYPIINÆ subfamily new.

6. Antenna short, not more than 8-segmented, tending to become clavate; segments normal. Propodeum not emarginate behind.

Genera: *Incalia* Cameron, *Parasyzygonia* Rohwer, *Syzygonia* Klug and *Syzygonidea* Ashmead (South America Region)..... SYZYGININÆ.

- . Antenna long, many segmented (15-22); each segment broader apically than basally so that it is triangular in shape. Propodeum emarginate behind, leaving a blotch, though this is sometimes chitinized and not easy to distinguish.

Genera: ? *Cerospastus* Konow (Chile) and *Philomastix* Froggatt (E. Australia) PHILOMASTIGINÆ.

STYRACOTECHYS genus. nov.

Small broad species (about 4 mm. long).

Head very little developed behind the eyes (fig. 9a); mouthparts normal with 4-segmented labial and 6-segmented maxillary palps; eyes converge in front so that malar space is but linear; labrum asymmetrical, and produced on the right side; clypeus very short (shorter than length of pedicel); antennæ very close to hind margin of clypeus (at a distance of about half length of pedicel); antenna short (flagellum being about as long as the breadth of the head); funiculum and pedicel broader than flagellar segments and about as broad as long; flagellum not increasing in breadth apically; basal flagellar segments viewed from the side, with apical margin concave, and with a prolongation beneath (fig. 9b); frontal area with furrows obsolete; ocellar region slightly raised; ocelli arranged nearly in a line, the triangle being very broad based; behind the two hind ocelli is a carina.

Thorax.—Pronotum without a clear accessory suture; sternauli separating mesepisternum from mesosternum well developed; third pleural suture angulate in the middle, the angle pointing backwards. Wings as in *Diphamorphos* Rohwer

(see Benson 1934 (2) pp. 464-5) but that the 1st transverse cubital vein is missing and that in both fore and hindwings the apical cell is very much reduced.

Legs with exceptionally long apical tibial spurs (fig. 9c); claws simple.

Abdomen.—Propodeum very strongly emarginate behind so that there is a large area with a white, weakly chitinized surface between propodeum and tergum 2. Sawsheath (fig. 9d).

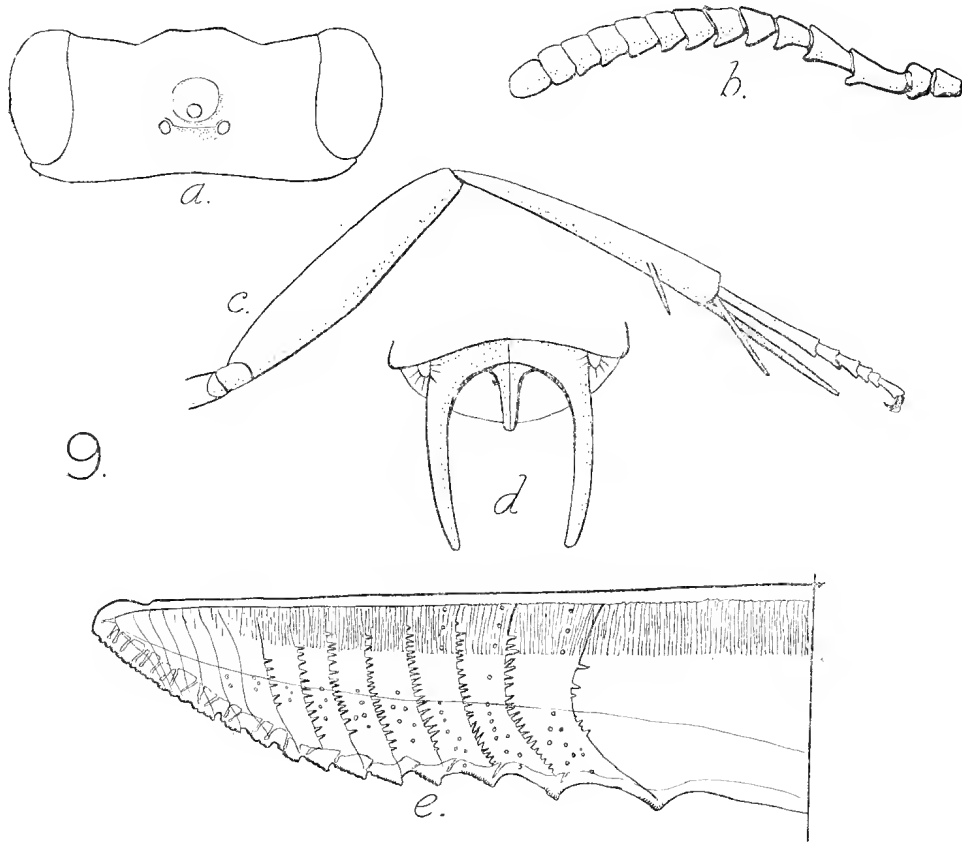


Fig. 9.—*Styracotechys dicelysma* gen. et. sp. nov.:

- (a) Head from above;
- (b) Antenna from the side;
- (c) Hind leg;
- (d) Sawsheath from above;
- (e) Saw.

STYRACOTECHYS DICELYSMA sp. nov.

♀ *Colour* yellow; black or fuscous are the head (except for the mouth-parts, clypeus, 4 basal segments of antenna which are brown), the side lobes

and scutellum of mesonotum, the hind tibiæ and tarsi, the abdomen from the middle of the 4th segment with the exception of the sawsheath. Wings hyaline; costa yellow; stigma and rest of venation brown.

Length (excluding genitalia) 4 mm.; forewing 4.5 mm.; antenna 1.8 mm.

Puncturation.—Surface mostly shining and unpunctured, but on the orbits, and side lobes of mesonotum is in places developed a very fine regular coriaceous sculpturing, and the dorsum of the abdomen is transversely rugulose.

Pubescence.—The whole insect, except the dorsum of the abdomen from segment 2, is covered with a fine regular pubescence.

Head.—Antenna with 14 segments. (fig. 9b).

Legs with long preapical tibial spurs on middle and hind legs; apical tibial spurs exceptionally long: on the middle legs the longer spur is equal to about three-quarters the length of the basitarsus; on the hind legs the longer spur is equal to the length of the 3 following tarsal segments together (fig. 9c).

Abdomen.—♀ Sawsheath viewed from above (fig. 9d); saw (fig. 9e).

New South Wales, Tooloom, 1 ♀, 1926, H. Hacker (Queensland Museum).

PERGA THOMSONI sp. nov.

♀ *Colour* black; yellow are mouthparts, the face in front of a transverse line on a level with front ocelli and genæ at the sides up to a level with the top of the eyes; on all the legs the tibiæ and tarsi, and on the front legs the apical half of the femur also. Wings hyaline at the base, slightly infusate at apex from below the stigma; stigma, and venation black.

Length 18 mm.; forewing 12.5 mm.; antenna 1.2 mm.

Head.—Face shining unpunctured with sparse pubescence; a transverse band from eye to eye, including the ocelli, thickly and finely punctured and covered with dense pubescence; head behind the eyes convex and with coarse scattered punctures and sparse pubescence; mouthparts normal; elypeus slightly emarginate in front; malar space very short, about as long as 3rd segment of antenna; antenna paradoxically short (shorter than distance between antennæ), 6-segmented; pedicellum very short, more than twice as broad as long; flagellar segments all forming a club; segment 3 = 4 + 5; segment 6 longer than rest of flagellum; median fovea as a deep groove stretching back to front ocellus, and with a large flat cushion each side and behind the antennæ; eyes large elongated, concave in the inner side; ocelli far apart so that Pol: Ool in the proportion of 18:13; post-ocellar area bordered at the sides with coarse punctures, and broader than long (in the proportion of about 6 to 5).

Thorax.—Mesonotum in front of a transverse line reaching from tegula to tegula is rough, dull, densely and finely punctured and covered with close fine pubescence; rest of thorax is smooth shining with scattered coarse rounded punctures and sparsely haired; scutellum flat, broader than long, with front margin broadly rounded, hind margin swollen a little in the middle, and with sharp slightly produced corners. *Wing* venation normal with the 3rd transverse cubital vein strongly bent in the middle as in *Perga dorsalis* Leach (see Morice 1919, plate xv, fig. 14). Hind legs with tarsal segments together much shorter than tibia.

Abdomen with almost obsolete fine rugulose sculpturing, the surface being smooth and polished.

New South Wales, Tooloom, 1 ♀, 12-ii-1922 (H. Hacker).

This very fine new species I dedicate to the great Swedish entomologist C. G. Thomson; this is to continue the policy of Westwood in naming species of *Perga* after Hymenopterists. *Perga thomsoni* sp. nov. would run down in Morice's key to couplet 16 where it will not fit owing to its entirely black thorax. It appears to be closest in structure to *P. christi* Westwood, but the temples are more heavily punctured and the scutellum has definitely angular projections at the hind corners, while in *P. christi* Westwood the projections are rounded. Unfortunately the unique specimen on which the species is based had its abdomen so badly eaten out by *Anthrenus* that the saw was missing.

Morice 1919, p. 265, gave the descriptions of two *Perga* spp. which he could not fit into his key as they had their antennæ missing. In the Queensland collection are representatives of both these species, both having exceptionally short yellow antennæ, so that *P. walkeri* Westwood comes very close to *P. mayrii* Westwood and *P. christi* Westwood as suggested by Morice comes very close to *P. dalbohmi* Westwood and *P. vacillans* Morice. Both *P. walkeri* Westwood and *P. christi* Westwood were recorded from South West Australia by Westwood 1880, p. 368 and 366. In the Queensland Museum collection *P. christi* Westwood is represented by 1 ♀, Queensland, Bunya Mountains, 9-xii-1925 and *P. walkeri* Westwood by 1 ♀, Queensland, Brisbane, Mount Cootha, 20-i-1925, H. Hacker, and 2 ♀♀, North Queensland, Ayr, 30-x-1925, S. Bates.

Either here we have an extraordinary case of distribution or else, what seems more probable, there was some error in the localities recorded by Westwood.

XYLOPERGA PERKINSI sp. nov.

♀ *Colour* yellow; black are the tips of the antennæ, an ocellar patch, the shortest middle part of the pronotum, the meso- and meta-notum (except the scutellum and the sides of the mesonotal lobes reaching from front angles of the

scutellum to the tegulæ), propodeum and front half of abdominal tergum 2, the lower portion of the mesepisternum together with the mesosternum and mesepimeron and the meta-sternum and metepimeron, the middle of hind coxæ, and the abdominal sterna. Wings tinged with yellow, especially forewings; hind wings nearly hyaline; stigma dark brown; costa and venation brown.

Length 17 to 18 mm.; forewing 14 to 15 mm.; antenna 3 mm.

Pubescence very sparse, almost entirely absent from head (except mouthparts) and thorax, very short and scattered on ventral surface of abdomen.

Head.—Face with sparse coarse punctures; head behind antennæ more strongly punctured especially on depressed borders to postocellar area and temples; malar space about half-length of pedicellum; antenna 7-segmented; about as long as shortest distance between eyes; clavate from apex of 5th segment; distance between the hind ocelli greater than distance from ocellus to eye; median fovea and frontal furrow fused to form a pear shape depressed area including the front ocellus; lateral furrow starts on about a level with the front ocellus and continues back as a slight depression to the vertex; post-ocellar area slightly convex and rounded.

Thorax.—Shining all over with coarse scattered rounded punctures becoming dense on the front and side lobes of the mesonotum, especially on the middle of the side lobes, and very sparse on scutellum which is strongly contracted behind, slightly depressed longitudinally in the middle and with very small appendages behind; mesosternum and metapleuræ unpunctured. *Abdomen* with transverse rugulose sculpture.

♂ *Colour*.—Yellow except for the following which are black: tips of mandibles; the ocellar region and a band stretching backwards to the vertex each side of the post-ocellar area; pronotum in front and side lobes of mesonotum (except the raised margins of the side lobes stretching from tegulæ to scutellum); depressed parts of metanotum; dorsal parts of abdominal terga. *Wings* yellowish hyaline with patch of scales (? androconia) occupying sub-costal, first discoidal and first two cubital cells of forewing; stigma brown; tegula and venation yellow in basal half of wings, brown in apical half.

Length 13 mm.; forewing 11 mm.; antenna 3 mm.

Structure as in female except for wings, genital segments and slightly denser puncturation noticeable on mesopleuræ where between punctures the surface is dull and rugulose.

West Australia, Cunderdin, 2♀♀ (including holotype) 3♂♂ (including allotype); (holotype, allotype and 1 ♂ paratype returned to Queensland Museum;

1 ♂, and 1 ♀ paratypes in British Museum); 1 ♀ (paratype) var. with abdominal terga 1-7 black in the middle (though at the sides, and on segments 5, 6, and 7, also on the front and hind margins, yellow), returned to Queensland Museum.

This beautiful species is dedicated to Dr. R. C. L. Perkins, F.R.S.

By its rich yellow colour and dark stigma, and by its sparse coarse puncturation with shining spaces between, distinguishable from all other species. The paler form is in colour superficially like *X. aurulenta* Morice and *X. univittata* W. F. Kirby, but both these have a pale stigma, dark hind femora and a densely finely punctured head and thorax. The dark form is rather like *X. amenaida* W. F. Kirby, but this is rather more black in colour and much more sparsely punctured, the head being almost entirely without punctures.

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Morice, F. D. . . 1919, *Trans. Ent. Soc., London*, 1918 (1919) : 247-333, plates xi-xv.
Westwood, J. O. 1880, *Proc. Zool. Soc., London*, 1880 : 359-379.

AN ABNORMAL LORIKEET.

BY H. GREENSILL BARNARD.

(Plate XXXIII.)

In November, 1934, a specimen of a yellow "Rainbow" or "Blue Mountain" Lorikeet, *Trichoglossus moluccanus*, was presented to the Queensland Museum by Nurse E. Doig, Wynnum. The bird had died in captivity. According to information received, it had been captured some years before at Gunalda, near Gympie. The specimen is a female.

The striking plumage of this abnormal bird is shown in Plate XXXIII, and a typical "Rainbow Lorikeet" is also shown for direct comparison. A close study of the yellow or golden form will reveal that the uniform green on the wings, back and tail of the normal bird is replaced with gold with a misty film of green showing. The coloured Plate has been made from paintings by Miss V. Barnard.

Xanthoehroism, or an abnormal replacement of another colour by yellow, is very rare among our Australian Lorikeets. Among the seed-eating parrots (lories), variation of colour is not uncommon, especially in the case of the Pale-headed Rosella, *Platycercus adscitus*. It has been suggested that yellow colouration may be obtained by feeding birds on certain foods, but this could hardly occur among the lorikeets, as they are almost entirely honey-feeders.

A case of "mixed albinism and xanthoehroism" in *Pyrrhulopsis splendens* from Kandavu Island was recorded, with a coloured Plate, by Casey A. Wood in *The Emu*, Vol. XXIII, January, 1924, p. 161. Xanthoehroism in a female specimen of *Platycercus elegans* was noted by H. L. White in *The Emu*, Vol. XVI, 1916, p. 108.



Trichoglossus neohaereticus: Yellow and normal forms.

NOTES ON REARING YOUNG CERATODUS.

BY A. RUDEL.

It was my good fortune to receive on December 1st, 1933, through the Queensland Museum, two specimens of the Queensland Lungfish, *Epiceratodus forsteri*, for the purpose of rearing them, if possible, to the adult stage. These fish were hatched out by the late Dr. T. L. Baneroft and were, after his death, sent with a few others to the Museum by his daughter, Dr. Josephine Maekerras. When received the fish were 17 mm. in length. They were hatched out between September 23rd and October 9th, 1933.

After their long journey from Eidsvold, the two small fish seemed in poor condition, and one of them was floating upside down in the container, but a slight touch sent it to the bottom very much alive.

I prepared an all-glass aquarium, size 30 x 9 x 9 cm., in the following manner :—The bottom was covered with well-washed coarse sand to a depth of 50 mm., rising to a height of 120 mm. at one end. I covered the highest part of the floor with smooth pebbles the size of hazel nuts to provide hiding places for the fish. The height of the water was just flush with the highest point, *i.e.* 120 mm.

Out of a few long-established aquaria I siphoned some sediment consisting of decayed vegetable matter, such as aquatic plants and algae and excreta of aquatic snails and fish, which covered the new tank to a depth of about 10–12 mm. This sediment sinks quickly to the bottom and leaves the water quite clear. It contains a host of living organisms. To keep the water pure I planted a few sprigs of *Hydrilla* and *Ceratophyllum demersum*. After making sure that the temperature of the water in the new tank was equal to that in the container, which was 24 Celsius, I transferred the two specimens. Colour of young fish :—blackish above and lighter below. Now the vexed question of feeding presented itself. I did not have the faintest idea what they would eat or what they would require. As I could see by their size that they were past the infusoria stage, I decided to give them a mixed diet and feed them on things with which I generally feed young fry. First of all I placed a lot of mosquito rafts (eggs of *Culex*) in the aquarium ; then I strained a quantity of mosquito larvæ through a fine tea strainer and also crushed three or four aquatic snails in the water. After two days I rubbed a few Enehytræ worms through a fine strainer. Two days later I rubbed a little shredded raw beef through a fine strainer, giving them a change of diet every second day. Needless to say I took great care not to foul the water, especially as I had placed the tank in a position where the light was only subdued.

After about a month I siphoned half the water out of the tank and renewed with fresh water of the same temperature. The fish lived and I took the first measurements on March 4th, 1934, when they had attained the length of 50 mm. Colour : dark chocolate above and just a shade lighter below.

Now came the time to transfer the fish to a bigger tank and I was dubious as to how they would stand the change. I prepared a tank, size 55 x 30 x 30 cm., well planted with *Hydrilla* and *Vallisneria*, and formed a kind of grotto with some large smooth stones. Height of water 15 cm. The fish stood the change well and disappeared at once among the stones. The new tank also contained the above-mentioned sediment to a depth of about 15 mm. Now I fed them with mosquito wrigglers, *Enehytræ* worms, finely-shredded raw beef and crushed aquatic snails. When measured on May 25th the fish were 75 mm. The colour then was dark chocolate above and below, with mottled lighter spots, also five distinct black spots on both sides of the tail. The water was raised to full height of aquarium (30 cm.). On July 10th the bigger of the two fish was 103 mm., the other fish was about 10 mm. shorter.

There is not much to write about the behaviour of the fish, as they lead a rather quiet and sedate existence ; they are essentially "bottom feeders" and approach their food with jerky movements. They resemble very much the Mexican Axolotl in their movements, but they move like lightning when touched ; in fact one jumped right out of the aquarium on one occasion. They prefer to rest in the sediment and it is my opinion that a layer of this is of vital importance in rearing *Ceratodus*.

One of the two specimens measured on August 23rd, 1934, was 122 mm., in maximum length.

Another specimen reared from ova obtained from Mr. George Sigg, Drinan, near Bundaberg, Burnett River, attained a length of 156 mm. in the course of twelve months in similar conditions.

Editor's Note.—The two *Ceratodus* were placed in the Bancroft Memorial Aquarium in the Queensland Museum on March 21st, 1935. One was approximately eight inches in length, the other being distinctly shorter. References to Dr. T. L. Bancroft's published work on *Ceratodus* will be found in the paper on Juvenile Lungfishes (Memoirs of the Queensland Museum, Vol. IX, 1928, pp. 160-173).

A NEW *ASTACOPSIS* FROM NORTH QUEENSLAND.

BY KATHLEEN WATSON, B.A.

(Plate XXXIV.)

Species of *Astacopsis* have been recorded as characteristic Southern Australian crayfishes. Therefore it was surprising to receive a spiny crayfish from the Cairns district, North Queensland, in July last. This was kindly forwarded by Dr. H. Flecker, President of the North Queensland Naturalists' Club. The specimen was collected at Root's Creek, near Mt. Carbine, in the Mt. Molloy district, about 80 miles west of Cairns.

***ASTACOPSIS FLECKERI* sp. nov.**

Described from a single specimen. Male. Type locality: Root's Creek, North Queensland.

In its outstanding characteristics, this crayfish appears to be more closely allied to *A. franklinii* of Tasmania than to its nearest geographical congener, *A. serratus*. The species differ, however, in a complex of minor characters of armature and sculpturing that can best be seen by comparing the figures of the two. The most noticeable difference is the absence in *A. fleckeri* of the median suture which appears so prominent a feature of the carpus of the cheliped of *A. franklinii*. This is represented on the carpus of *A. fleckeri* only by a very slight shallowing. In *A. fleckeri*, also, the lateral keels of the rostrum are not so prominent, and each is provided with only three spines, which appear shorter and blunter than those in the figure of *A. franklinii*.

The other more important differences are the development of the exopodite of the 3rd maxilliped, which is much longer in *A. fleckeri*, and the shape of the antennal scale. This appears relatively broader than that figured by Geoffrey Smith for *A. franklinii*, and the inner border is almost semi-circular when viewed from above.

Measurements.—

Maximum length from tip of rostrum to posterior border of telson, 223 mm.

Right chela—Maximum length, 93 mm.; maximum breadth, 38 mm.

Left chela—Maximum length, 100 mm.; maximum breadth, 42 mm.

The left branchiostegite was removed and the gills examined. These show no marked difference from the typical characters of the genus.

The rostrum is broad, rounded and concave; there are seven subequal, blunt spines around the raised border; the anterior one is not enlarged, and is not produced posteriorly as a keel on the concave median surface.

Except for minute pitting, the median portion of the carapace is smooth. Antero-laterally there are tubercles and small, blunt spines. The branchiostegites also bear tubercles, sparsely scattered except on the posterior portion,

where they are slightly more numerous. Behind the ocular margin there is a small, depressed keel, without an anterior spiny point, and behind this a small tubercle. This sculpturing is relatively less prominent than that figured for *A. franklinii*, and that in our specimens of *A. serratus*.

The inter-antennal spine is long and narrow, with three serrations on either side.

The metopic plate is relatively smooth and glabrous, unlike that of *A. serratus*, with a few hairs sparsely clothing the posterior portion. There is a group of about twelve tubercles on each lateral border. The oral border consists of a transverse, rounded bar, very slightly curved; the lateral margins are sub-spherical.

The lateral border of the 1st abdominal segment bears a sharp spine.

The left lateral border of the 2nd abdominal segment bears four large sharp spines, and the right bears five.

The 3rd to the 5th abdominal segments bear laterally a sharp spine, decreasing in size on each segment posteriorly. The 6th segment bears no spines, although on the right side there is a small tubercle some distance from the lateral border.

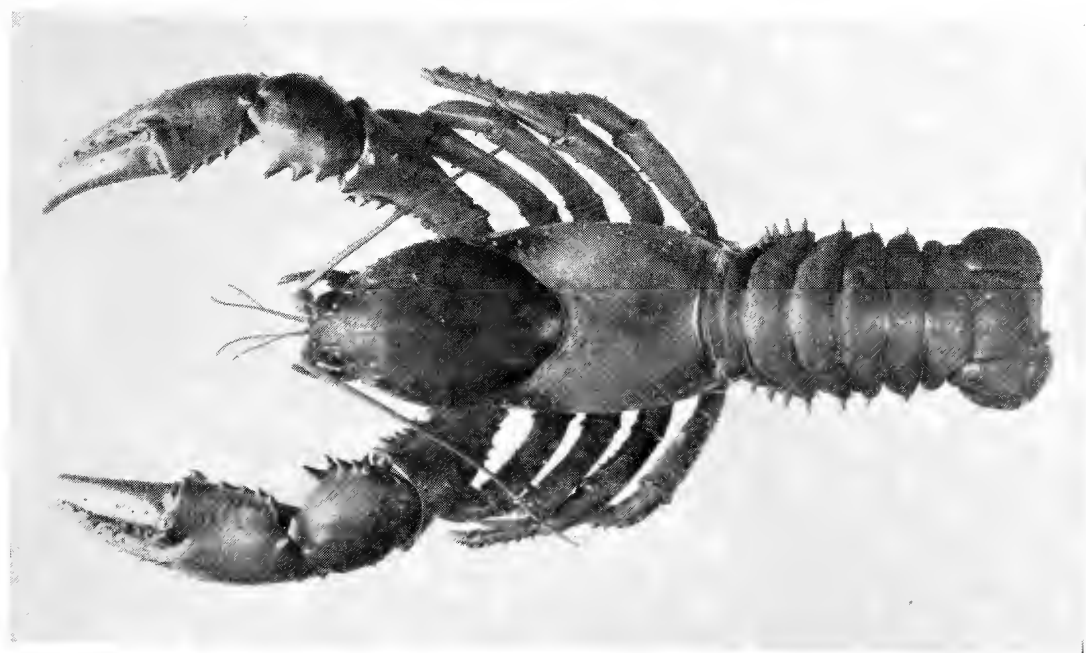
The exopodite of the uropod has a row of teeth between the hard and membranous portions. The endopodite has two spines between the two portions—one on the external border and one in the middle line. The telson has two lateral spines.

The exopodite of the 3rd maxilliped reaches or slightly exceeds the 3rd segment of the endopodite.

The propodus of the chelipeds is serrated internally and externally. The biting edges of the propodus and the dactylus bear rows of tubercles, some of which are greatly enlarged. The upper surface of the carpus is smooth and tumid, with only a faint trace of a median suture. On the under surface, there is a transverse row of three large spines, extending from near the anterior margin to the middle of another row of spines (three on the right cheliped, four on the left) on the inner margin. There are two smaller spines on the outer margin. The merus is armed on the upper margin with a row of spines; on the under margin there are two rows—an interior row of seven or eight spines, and an exterior row of three larger spines. The ischium is provided with a few small spines on the under margin.

The 1st walking leg has one spine on the anterior border at the distal end. This is absent on the left leg. Each of the 2nd pair of walking legs bears a single spine on the posterior border at the proximal end. On the two posterior pairs the spines are much more numerous.

Colour in spirits.—General colour of head, dorsal portion of thorax and abdomen, and of the chelipeds, dull bluish-green; the antennæ and antennules congo pink; the membranous portion of the tail-fan, darker congo pink; spines on



ASTACOPSIS FLECKERI.

the chelipeds and the tips of the great chelæ carmine ; tubercles on the biting edges dull carmine at the base, cream-buff above ; legs greenish glaucous blue, deep greenish glaucous at their extremities ; chelæ on 1st two legs dark olive-buff.

(Colour names taken from Ridgway's " Colour Standards and Nomenclature," 1912.)

It may be noted that specimens of the well-known *A. serratus* have been received from such localities in Southern Queensland as Tamborine Mountain and the Lamington National Park. McCulloch¹ has also recorded specimens from near Stanthorpe, and made notes on the variations in colour that these crayfish exhibit. It is evident that *A. serratus* has a far wider range than that recognised by Geoffrey Smith², who regarded the Blue Mountains as its northern limit.

In view of this discovery, it is interesting also to note that *Astacopsis* was recorded by Nobili³ from Sorong, New Guinea, from a specimen collected by D'Albertis. Later authorities,² and ⁴ however, regarded this as a probable mistaken locality.

Special efforts are being made by members of the North Queensland Naturalists' Club to obtain additional material.

¹ A. R. McCulloch, Recs. Aust. Mus. XI., p. 237-238.

² Geoffrey Smith, P.Z.S., 1912, pp. 144-169.

³ G. Nobili, Annali del Mus. Civ. Stor. Nat. Gen., 1899, 40, p. 246.

⁴ Walter Faxon, Mem. Mus. Comp. Zool., XL., No. 8, p. 352.

PALÆONTOLOGICAL NOTES.

BY H. A. LONGMAN (DIRECTOR).

Notable additions have been made to the series of vertebrate fossils in the Queensland Museum as the result of a collecting trip by Mr. J. Edgar Young, Honorary Collector, in the Hughenden district, North-western Queensland, in April and May of this year. This preliminary note on some of the specimens received may be amplified later.

ICHTHYOSAURUS AUSTRALIS.

Although numerous fragments of Ichthyosaurians had been received from time to time from localities in Cretaceous areas near Hughenden, no significant associated material had been collected. Mr. Young was fortunate in discovering on Telemon Station the greater part of a complete skeleton. He notes that this was found "in shaley ground one mile eastward of the Telemon homestead in a paddock on hill towards the woolshed." A small exposed fragment was fortunately noticed and the remainder of the fossil was excavated.

This skeleton is approximately eighteen feet in length. Practically all of the vertebræ appear to be preserved, although the series was somewhat disrupted when found. The skull is about four feet six inches in length, the extreme tip being missing. This skull has been obliquely crushed with intense lateral pressure from the right side, resulting in great displacement of the elements behind the rostral portion of the jaws.

Although many fragments of ribs are present, these are much broken and abraded. Much of the skeleton is at present largely involved in matrix, including the remains of numerous bivalves. The skull is apparently of the same species as that described in detail by the writer in 1922¹.

Portion of one of the anterior limbs is exposed. The whole region of the pectoral girdle, however, is much distorted and involved in matrix. An incomplete humerus and radius and ulna with adjoining elements have been partly cleaned. The radius and ulna are not elongated. The distal ends of these bones are recessed medially for a prominent intermedium. Additional breadth is given by a pisiform, which also articulates with the humerus. Only the proximal elements of the paddle can be precisely allocated, but it is obvious that this is of the Latipinnate type of the family Ichthyosauridæ and not of the Stenopterygiidæ.

It is hoped that other significant features will be revealed when matrix is cleared from the skeleton.

¹ H. A. Longman, Mem. Qld. Mus., Vol. VII., pp. 246-256.

KRONOSAURUS QUEENSLANDICUS.

Mr. Young also collected on Telemon very massive fragments of this gigantic Pliosaur, first described by the writer in 1924, with additions in 1930 and 1933.²

The largest specimen from Telemon consists of the central part of a skull, including the orbits and portions of the post-temporal fossæ. The upper and lateral portions of this fragment have been greatly abraded, and the outer part of the left maxilla has disappeared to such an extent that the alveolar portions of the massive teeth are fully exposed. Some portions of the teeth had been removed as curiosities, having been chipped away.

Many hundredweights of massive fragments belonging apparently to this species were collected by Mr. Young in three localities on Telemon. These specimens include other cranial fragments, portions of mandibular elements, vertebræ and incomplete bones not yet identified. Apparently these valuable specimens represent at least two and probably three individuals. Unfortunately, most of these fragments have long been subjected to surface weathering and the contours are partly obscured. None the less, when cleared of matrix (a process that will entail months of careful work), these massive remains will add greatly to our knowledge of this gigantic marine reptile.

From the fragments preserved in the alveolar cavities of the mandibular symphysis of the original type specimen, it was suggested that the larger teeth of the series would attain "at least 250 mm.," the maximum alveolar diameter being 40 mm. In one of the Telemon specimens, however, the diameter of an alveolus is no less than 55 mm., which shows that some of larger teeth exceeded this estimate.

It is of interest to recall that in 1932 Mr. W. E. Schevill secured for Harvard a magnificent skeleton of *Kronosaurus*, collected at Army Downs, in the Richmond district. About five tons of material were obtained, and this will doubtless be described in detail later.

* * * * *

In 1929 a list of records of vertebrate fossils from new localities was given by the writer (Mem. Qld. Mus., Vol. IX., pp. 250-251). The following are additional records of new localities or of specimens of special interest.

Megalanina prisca.—A single vertebra, found on a creek at Sandhurst Park, Fernlees, 187 miles west of Rockhampton, was presented in 1932 by Mr. J. Garvey. (F. 2291.) This is a large vertebra from the dorsal region. In 1924 a vertebra was recorded from Marmor Quarry, 24 miles south of Rockhampton, but the remainder of our specimens come from Diprotodon beds on the Darling Downs. Unless the

² H. A. Longman, Mem. Qld. Mus., Vol. VIII., Part 1; Vol. X., Parts 1 and 2.

tail of this giant lizard was relatively short in comparison with the "goannas" of to-day, including the largest living monitors found at Komodo, it probably attained over twenty feet in length. The vertebræ of *Megalia* and *Varanus* have been described in great detail by the late Baron G. J. de Fcervary (*Annales Musei Nationalis Hungariei*, XXIX. 1935).

Diprotodon australis.—A fragment of a lower jaw of this large marsupial was picked up in the bed of Fletcher's Creek, about four miles from the Logan Downs Station, near Clermont, and presented by Mr. H. W. Eite, through Mr. H. R. Deane, Land Commissioner. (F. 2339). A fragment of a *Nototherium* mandible, also found near Logan Downs, was recorded in 1929.

Diprotodon australis.—Incomplete worn molar teeth found on the left bank of the Sellheim River, south-west of Bowen, have been presented by Mr. F. M. Hutton. (F. 2250.) These were found one mile from the junction with Percy Douglas Creek.

Diprotodon australis.—A fragment of a femur, found near embankment of a dam on a watercourse at Cooromon, Boyneside, *via* Kingaroy, was presented in May, 1933, by Mr. A. Slater. (F. 2319.)

Diprotodon australis.—A molar found at mud springs, near Eulo, in the Cunnamulla district, was sent in by Mr. G. C. Clark. (F. 2131.)

Diprotodon australis.—We are indebted to Dr. F. W. Whitehouse, Hon. Palæontologist, for a massive maxillary fragment, with remains of molars, found in the Diamantina River at Birdsville. (F. 2419.)

Diprotodon australis.—Mr. Thomas Jack, Dalby, presented a specimen consisting of remains of a palate of a very old *Diprotodon*; only the second molars on each side are in position and these are worn almost to the roots. This was found at Ranges Bridge, Condamine River, some fifteen miles west of Dalby. (F. 2346.)

Plesiosaurus spp.—Many vertebræ and fragments attributed to this genus, used in the broad sense, have been received from Western Queensland and they are the vertebrate fossils most frequently collected. Unfortunately, the material has not been sufficiently significant to enable a local worker to make adequate comparisons with other species or even genera. Two species, *Plesiosaurus macrospondylus* and *P. sutherlandi*, were very concisely described by McCoy in 1867, but little has been published since, apart from the records by Jack and Etheridge in the "Geology and Palæontology of Queensland," 1892, pp. 508-10. Hundredweights of vertebræ, some in associated series, have been received during the last twenty years at the Queensland Museum, in addition to remains in the old collection.

A series of 24 associated vertebræ collected in the Flinders River, near Richmond, was presented through Mr. G. E. Blake. (F. 2085.) Another series of vertebræ with other fragments, mostly embedded in matrix, found at "Caithness," Dartmouth, was collected and presented by Mr. A. B. Cribb. (F. 2100.) About ten

vertebræ from Baneda, *via* Augathella, were presented by Mr. George S. Martin. (F. 2329.) Seven incomplete vertebræ from Ashgrove, near Brixton, Barealdine, were collected and presented by Messrs. H. A. Craig and C. Loft. (F. 2178.)

The typical dorsal vertebræ have centra about 80 to 95 mm. in length. These centra are somewhat constricted in the middle, and their transverse and vertical diameters are subequal. In well-preserved specimens the maximum diameter is about 105 mm.

Howehin has figured cervical vertebræ from "the Cretaceous beds of the Neales River, north-westward of Lake Eyre," which are very similar to some of our cervical specimens (Handbooks of the Flora and Fauna of South Australia, "The Building of Australia," Part II, 1928, p. 320).

Fragments from the shoulder-girdle are associated with the "Caithness" fossils, but these have not yet been freed from matrix.

As previously mentioned, the generic term *Plesiosaurus* is only applied in the wide sense, and, when better known, these fossils will probably need distinctive generic recognition. D. M. S. Watson has noted that *Elasmosaurus* occurs in Queensland (P.Z.S., 1924, p. 885). Judging from the vertebral characters outlined by Watson, these fossils belong to the "small-headed, long-necked Plesiosaurs."

Only one small cranial fragment has been received, and this, although much abraded and involved in matrix, shows portions of maxillary bones with remains of small teeth projecting obliquely. This was collected by Mr. J. Edgar Young on Telemon Station during his recent trip. (F. 2448.)

"Plesiosaur."—From Mount Abundance, near Muekadilla, South-western Queensland (Roma Series), we have received fragmentary material representing a large Plesiosaur. This includes a fragment of a paddle, presented by Mr. R. J. Bampton. This interesting specimen, which is embedded in matrix, shows massive, elongated phalanges, some of which are over 70 mm. in length. These phalanges are constricted in the middle and they are oval in section. (F. 2242.) Other specimens, said to be from the same fossil, were presented by Mr. William Schmid through Dr. H. I. Jensen, who informs me that this Mount Abundance discovery was in Portion 32, Parish of Norman. Associated with the fossils was a deposit of water-worn pebbles, one to three inches in diameter, forming a nest near the actual bones.

Notochelone costata.—We are indebted to Mr. Ulick Browne for a fairly complete carapace of this chelonian, which was discovered at Garomna, Julia Creek, North-western Queensland. (F. 2174.)

DAVID WHYTE, Government Printer, Brisbane.

